REMARKS

Claims 1-20 are pending, with claims 1, 11 and 18 being independent. Claims 8, 9 and 12-17 have been withdrawn. Claims 1, 7, 11 and 18 have been amended. No new subject matter has been added. Applicant respectfully requests reconsideration of the claims in view of the following remarks.

Drawings

The drawings have been objected to for failing to clearly show or label "free-standing thin film" as described in the specification. Applicant believes the examiner is correct in the assumption that second electrode 30 is a free standing thin film. To make this clear, the specification has been amended to clearly recites that electrodes 30 and 220 are free-standing thin films.

Claim interpretation

The office action indicates that "an alloy of aluminum" is the same as an "aluminum alloy." Applicant agrees. Further, the claims have been amended to make clear that impurity amounts of magnesium are not sufficient (unless the impurities are more than 0.1 atomic weight percent).

Prior Art Rejections

Claims 1-7, 10, 11 and 18-20 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,791,188 ("Hagihara") in view of U.S. Patent No. 6,261,943 ("Grupp"). In addition, claims 1-3, 11 and 18-20 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over "Mechanical Tests of Free-Standing Aluminum Microbeams for MEMS Application" (hereinafter "Zhang") in view of "Aluminum and Aluminum Alloys" page 637 and

claims 1-3, 11 and 18-20 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Grupp in view of "Aluminum and Aluminum Alloys" page 637. Applicant respectfully traverses these rejections.

Claim 1, as amended, specifically recites a free-standing thin film comprising an alloy of aluminum and at least magnesium "wherein the magnesium content is at least 0.1 atomic weight percentage." Applicant respectfully submits that the references of record do not teach or suggest the limitations of claim 1.

Hagihara discloses a thin film of an aluminum alloy wherein the film is formed as a film on a substrate. However, the presently claimed invention concerns a free-standing thin film. As acknowledged in the office action, how Hagihara does not teach or suggest a free-standing thin film.

To remedy this shortcoming, the office action refers to Grupp, which discloses a free-standing thin metal film composed of a trilayer film. In column 6, lines 36-65, three realizations of a thin metal film according to Grupp are discussed. Each film comprises three layers in a symmetric configuration: Al-Ni-Al, Cr-Ti-Cr and Al-Ag-Al. Symmetric multilayer metal structures are particularly unsusceptible to mechanical stress due to distortion because the distortion is cancelled out due to the symmetrical layout. Accordingly, it can be concluded from Grupp that a trilayer free-standing thin film is advantageous over a single layer free-standing thin film as the single layer is more susceptible to distortion. Accordingly, one of ordinary skill in the art would not replace the three-layer structure by a single metal layer.

However, the inventor of the present invention has found a solution to this prejudice. In particular, a material is provided allowing the construction of a single layer free-standing thin film and providing a low sensitivity to creep and to distortion. In other words, the inventors have

found that a three-layer symmetric structure, as disclosed by Grupp, is not necessary to solve these objectives. Instead, the present invention suggests the use of a free-standing thin film comprising an aluminum alloy and at least magnesium.

Summarizing, one of ordinary skill would not combine the material disclosed by Hagihara with a free-standing thin film as shown by Grupp. Especially as Hagihara solves a different objection than the present invention and further in view of Grupp teaching that the free-standing thin film should comprise a three-layer symmetric structure.

With regard to the rejections in view of Zhang with "Aluminum and Aluminum Alloys" and Grupp with "Aluminum and Aluminum Alloys," both objections are based on the interpretation that pure aluminum has impurity amounts of magnesium of 0.18 ppm. However, by incorporating a lower boundary regarding the magnesium amount of 0.1 atomic weight percent this claim interpretation has been clarified. In this context the aluminum alloy of the device is not pure aluminum having insignificant impurities of Mg. Instead, the amount of magnesium is chosen significantly higher than 0.18 ppm to provide a material of the free-standing thin film having particular advantageous properties, such as a reduced sensitivity to creep and an increased yield strength.

Accordingly, claim 1, as amended, is novel and nonobvious. Applicant respectfully requests allowance of this claim.

Claims 2-7 and 10 depend from claim 1 and add further limitations. It is respectfully submitted that these claims are allowable over the references of record in view of their dependence on an allowable claim as well as the additional limitations.

Claim 11 has been amended in a manner similar to claim 1. It is therefore respectfully submitted that claim 11 is allowable over the references of record. Further, claims 8, 9 and 12-14

depend from claim 11 and, therefore, upon allowance of claim 11 should be rejoined and allowed.

Claim 18, as amended, specifically recites "second electrode comprising a free-standing thin film comprising an alloy of aluminum and at least magnesium, wherein the magnesium content is at least 0.1 atomic weight percentage." As discussed above with respect to claim 1, is respectfully submitted that claim 18 is allowable over the prior art.

Claims 19, 20 depend from claim 18 and add further limitations. It is respectfully submitted that these claims are allowable over the references of record in view of their dependence on an allowable claim as well as the additional limitations.

Conclusion

Applicant has made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Ira S. Matsil, Applicant's attorney, at 972-732-1001 so that such issues may be resolved as expeditiously as possible. The Commissioner is hereby authorized to charge any fees that are due, or credit any overpayment, to Deposit Account No. 50-1065.

Respectfully submitted,

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Date

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